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49. (New) An animal produced by the process of claim 29.

50. (New) The animal of claim 49 wherein said animal is swine.

51. (New) The animal of claim 50 wherein said swine is a miniature swine.

52. (New) The animal of claim 50 wherein said miniature swine is of the D/D haplotype.

REMARKS

Claims 26-44 are pending in the case. All pending claims have been rejected.

Rejection Under 35 U.S.C. §112 (Paragraph 1 – Written Description)

Claims 27-44 were rejected under section 112, first paragraph, as not meeting the written description requirement.

Initially, Applicant notes that claim 27 is directed to a miniature swine and not to a method. The rejection appears to be directed to methodology and so Applicant believes that the rejection was intended to be directed to claims 28-44.

Initially, Applicant responds that the methods disclosed in the application are useful in breeding animals free of endogenous retroviruses regardless of the nature of the animal. However, Applicant has amended claims 28 and 29 to recite use of a process for producing human tropic PERV-free animals using a screening step for PERV species that can infect human cells. It should be emphasized that the claimed breeding program does

not eliminate all virus but does eliminate infectious (i.e., human tropic) virus (which are only a small part of the overall ERVs – see application at page 19, lines 6-7). Methods of mating such animals are well known in the art but what is not known is that infectious (i.e., human tropic) PERVs can be removed from the genome by the selective breeding taught by the Applicant. Thus, Applicant is in possession of a valuable process for utilizing screening to determine the presence of infectious PERV (for example, by stimulating PERVs to express and then detecting said expression by reverse transcriptase – see non-elected claim 14, which amply describes one embodiment of such a detection system) and then applying a selective breeding program to produce such animals.

For example, if one uses the process of non-elected claim 14, then the determination of the presence of infectious PERVs is by application of known PERV stimulating agents (disclosed in the application at page 14, lines 21-24) and contacting with permissive cells (taught in the application at page 14, lines 24-25) to promote infection, co-culturing and then detecting reverse transcriptase. Thus, a means of detecting infectious PERVs in any animal cells (and thus in any animals from which those cells are derived) is achieved. Applicant has thereby provided methods that fully enable the claims. Applicant was fully in possession of the invention at the time of filing as shown by the filed application and the written description requirement has been met.

Further, Applicant believes that the amendment of claims 28 and 29 overcomes this ground of rejection. The rejection is based in part on the argument that the method as disclosed in the specification is directed primarily to achieving human tropic PERV-free swine (see Office Action at page 3, ¶2). In fact, the method is in no way so limited. Breeding programs as taught by Applicant should in no way be restricted to miniature swine, or any swine, or any particular mammalian species, absent a specific showing in support of such limitation. For example, a showing that swine breeding programs are not readily adaptable to other species or that swine breed differently from other mammals might suffice. However, no such showing was made. Thus, Applicant is entitled to the full

breadth and measure of his invention. Applicant therefore discloses a workable method for achieving human tropic PERV-free swine, which breeding program works the same for other infectious mammalian PERVs known at the time of filing. As such, a breeding program that produces offspring free of infectious PERV is fully expected to be successful regardless of the species.

Claims 28-44 were also rejected under section 112, paragraph 1, as being not sufficiently enabled by the disclosure of the specification. Applicant responds that because a method is provided that does not depend on the specifics of the PERV utilized (see examples in the specification) the method claims are fully enabled (thus, applicant teaches stimulants for PERVs, cells that are permissive, a method for detecting reverse transcriptase (all used in determining PERV presence) and directions for breeding the animals in conjunction with such detection methods). Applicants teach a method for breeding animals in conjunction with a method for detecting infectious PERVs, none of which are inherently limited to the specific infectious PERVs used in the application to better illustrate the invention and which methods are readily applicable to species other than swine.

Rejection Under 35 U.S.C. §112, Paragraph 2

Claim 26 was rejected under section 112, paragraph 2, as being indefinite for use of the phrase "...wherein at least of said animals..." Applicant responds by noting that claim 26 contains no steps. Applicant believes that the Examiner meant claim 28, wherein step (a) contains the indefinite language. In response, Applicant has amended claim 28 to add the word "one" after "least" and thereby overcome this ground of rejection (as suggested by the Examiner).

Claims 39-44 were rejected under section 112, paragraph 2, as being indefinite for use of the terms "PERV 1" and "PERV2" and the like on grounds that the literature does not recognize such terminology as being standard with respect to PERVs.

In response, Applicant has cancelled claim 42 and has amended claims 39-41 to recite, in place of the numbered PERV designations, a first and second set of PERVs bearing the same relationship to each other as in the cancelled language and supported in the specification by the same disclosure as the claims prior to amendment.

Rejection Under 35 U.S.C. §102

Claims 26-27 were rejected under section 102(b) as anticipated by Kaeffer et al (1976). The Examiner urges that Applicants concede that the DD haplotype does not naturally contain infectious PERV (no citation to the specification is provided) and thereby concludes that a prior art showing of DD Haplotype inherently represents a swine that does not produce infectious PERV. In response, Applicant has cancelled claims 26 and 27 without prejudice.

In addition, Applicant has added new claims 45-52, directed to animals produced by the breeding program of claims 28 and 29. Applicant also directs the Examiner's attention to the application at page 23, lines 19-21, which discloses selective breeding within the herd to maintain the MHC lines, and page 24, lines 12-26, which discloses that different cell lines are available to insure that the D/D pigs are not human tropic (since not all D/D pigs are PERV-free).

In fact, any haplotype is capable of producing PERV-free offspring and the invention in no way is limited to the D/D haplotype (which was only used to illustrate the

invention, i.e., the swine described in the application happened to be of the D/D haplotype, but this is not a requirement of applying the methods of the invention).

Applicant does not understand the Examiner's reference to Sachs et al (the only Sachs reference is the '708 patent entered in Applicant's IDS and this does not mention Kaeffer et al, although the herd used by Kaeffer was originally supplied by Dr. Sachs – see Kaeffer et al at page 732, next to last paragraph. In addition, Kaeffer does not appear to mention any breeding program conducted to remove ERV from the animals (D/D haplotype or otherwise). Further, the new claims are directed to animals inbred by the claimed processes so as to be free of PERV and this limitation is not present anywhere in Kaeffer. Nor does Kaeffer render such animals obvious because the claimed breeding program is unobvious. Thus, the new claims should be patentable over Kaeffer et al.

Applicant encloses herewith a Request for a two month extension of time to respond and a check for the requisite large entity fee. The Commissioner is authorized to charge payment of any additional fees associated with this communication, or credit any overpayment, to Deposit Account No. 03-0678.

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Alan J. Grant 12/11/02
Alan J. Grant, Esq. Date

Respectfully submitted,



Alan J. Grant, Esq.
Reg. No. 33,389

CARELLA, BYRNE BAIN, GILFILLAN,
CECCHI, STEWART & OLSTEIN
Six Becker Farm Road
Roseland, NJ 07068
Phone: 973-994-1700
Fax: 973-994-1744

AMENDED CLAIMS

28. (Once Amended) A process for producing a human-tropic ~~ERV-free~~ PERV-free animal from parental animals at least one of which is human-tropic ~~ERV-positive~~ PERV-free comprising:

- (a) mating a male and a female animal of the same species wherein at least one of said animals is positive for a human-tropic PERV-free ~~ERV-locus~~ and thereby producing whereby said mating produces offspring; and
- (b) screening said offspring for the presence of said human-tropic PERV and selecting offspring free of human-tropic PERV,
thereby producing a human-tropic PERV-free animal.

29. A process for producing a human-tropic PERV-free ~~ERV-free~~ animal from parental animals at least one of which is human-tropic ERV-positive ~~ERV-positive~~, comprising:

- (a) mating a male and a female animal of the same species wherein at least one of said animals is positive for a human-tropic PERV-locus ~~ERV-locus~~ and thereby producing offspring;
- (b) mating a male animal produced in (a) with a female animal produced in (a) wherein at least one of said male and female is positive for a human-tropic PERV-locus ~~ERV-locus~~ and wherein if both are positive for an PERV-locus ~~ERV-locus~~ then said male and female are not each positive for the same human-tropic PERV-locus ~~ERV-locus~~; and
- (c) screening said offspring for the presence of said human-tropic PERV and selecting those offspring that are human-tropic PERV-free ~~ERV-free~~
thereby producing a human-tropic PERV-free animal.

31. (Once Amended) The process of claim 30 wherein said animal swine is a miniature swine.

32. (Once Amended) The process of claim 31 wherein said miniature swine is are of the D/D DD haplotype.

37. (Once Amended) The process of claim 36 wherein said miniature swine is are of the DD D/D haplotype.

39. (Once Amended) The process of claim 38 wherein step (a) comprises mating pigs carrying a first set of PERVs PERV 1, 2, 4 and pigs carrying a second set of PERVs PERV 1, 2, 3, wherein each of said first and second sets of PERVs comprises at least one PERV not present in the other set, to produce offspring and step (b) comprises mating offspring of (a) carrying PERV 3, 4 with the step (a) 1, 2 positive offspring whereby such mating is between a first animal that carries PERVs present in both of said first and second sets of PERVs but no PERV not present in both of said first and second sets of PERVs and a second animal that carries the PERVs present in said first and second sets of PERVs but not present in both of said first and second sets of PERVs.

40. (Once Amended) The process of claim 39 wherein said pigs in step (a) carrying PERV 1, 2, 4 said first set of PERVs are male pigs and said pigs in step (a) carrying PERV 1, 2, 3 said second set of PERVs are female pigs.

41. (Once Amended) The process of claim 39 wherein said pigs in (b) carrying PERV 3, 4 are male pigs and said pigs in step (b) carrying PERV 1, 2 are female pigs first animal is female and said second animal is male.